

STI BULLETIN ONLINE

The STI Bulletin is a quarterly publication of the NASA Scientific and Technical Information (STI) Program produced by the NASA Center for AeroSpace Information (CASI) for the users of our information products and services.

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Featured Articles

New STI Website Launched

As part of NASA’s effort to provide a one-stop Internet portal (<http://www.nasa.gov>), the STI Program Office has been working to redesign its Website. Extensive comments from users have been received and implemented. According to George Roncaglia, STI Program Office Head, the redesign “makes the site more user-friendly, better accommodates NASA's use of a portal, and more successfully portrays the wealth of information that STI makes available to NASA and public users.”

The most conspicuous attribute of the new design is a flat architecture that allows you to see at a glance what information is available at the site and access much of this information with a single mouse click. Access to databases—the feature current Website users indicated was the most important to them—is now readily available. You can gain access—no registration required—to the [NASA Technical Reports Server \(NTRS\)](#), from anywhere in the site by clicking on the Search panel in the banner or the Search button in the vertical menu bar. You’ll also find a link to the [NACA Digital Library](#).

Other enhancements include a new **Tools/Products/Services** section, where you can link to descriptions of publishing tools, databases, periodicals and collections, indexes and bibliographies, and custom products and services. Once there, you can see just what the items look like by clicking on the **Sample** buttons. There are also buttons that take you directly to online products, **Subscribe** buttons that take you to the appropriate information or form, and **Order** buttons that let you make online purchases. The order form is simple. Just check off the products desired and specify the quantities and price for which you are eligible. Then, choose your preferred processing, shipping, and payment methods. For custom products and services, just describe your requirements and complete the customer information. An [Outreach Specialist](#) (see below) will contact you within one business day to discuss your requirements in detail.

The launch of the Website is only the beginning. Explore the site and see how it meets your needs. If there is something we can do to help you accomplish a particular task or accomplish it more easily, click the **Feedback** button on the main menu bar and describe your requirements.

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West Wing Calling ... Among Others

No, it wasn’t Martin Sheen. But we did get a call from the production staff of NBC television series, *The West Wing*, for a NASA video. “It made me remember a couple years ago when we had a rush order for a production staff putting together a video for the real White House,” said Chris Stark, the NASA Center for AeroSpace Information (CASI) Outreach Specialist lead for videos. In fact, we get quite a few interesting requests for footage from customers such as NBC Studios production staff, the *National Geographic*, Swedish Public Television, British Public Television, Oxford Television in Britain, and many American public television stations. And some of our best calls come from ordinary people who are fascinated by NASA’s extraordinary achievements.

To the public, we’re often their initial contact with NASA. So, we do our best to make it a good experience. Other than our friendly, helpful staff, we have some excellent tools at our—and your—disposal. First, the NASA videos held at CASI are unique in that they are organized by a systematic metadata (data about data) scheme. This makes searching for them easy and the search output precise and informative. Because we use the same metadata scheme for both videos and documents, video citations reside in our databases. Our staff uses the new NASA scientific and technical information knowledge base to respond to customer requests, which is also available to you if you are a NASA or other Federal agency employee, prime contractor, or grantee. You can also find video citations in the [NASA Technical Reports Database \(NTRS\)](#) or, if you prefer, browse the collection in the online [NASA Video Catalog](#).

CASI is the primary, but not exclusive, repository of NASA videos. For those times when there is nothing among our 2,000+ videos that meets a particular customer’s needs, we have a triage process in place to put the customer in touch with the appropriate Center video representative. We know, for example, that the Goddard Space Flight Center (GSFC) has a stellar collection of “Earth views greatest hits,” but that the Jet Propulsion Laboratory (JPL) is the “go to” place for Mars exploration videos. “Taking the time to give a brief explanation of the types of videos available at NASA Centers goes a long way with our customers. They are very grateful that we provide them with an explanation of their options to acquire the best possible footage for their needs,” says Stark.

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With NASA's robots searching for signs of life on Mars (see [Focus On...Robotics](#)), we would like to remind you that there is plenty that NASA is doing about life right here on Earth. From the unique vantage point of space, NASA researchers can see — and more importantly — predict how dust storms in the Sahara will affect crops in the American Midwest, how mosquito-born diseases will spread, and which part of a field needs fertilizer and which part does not (see [Earth Science Applications Directorate](#)). Underlying such practical applications is a massive body of earth science scientific and technical information.

Listed below is a sample of the Earth science material found in the [NTRS: NASA Technical Reports Server](#). The listing is limited to recently published, publicly available information. The documents are available for purchase by contacting the STI Help Desk (301- 621-0390 or [help@sti.nasa.gov](mailto:help@sti.nasa.gov)). Please use the Document IDs provided. NTRS has basic and advanced search capabilities for researching Earth science topics on your own.

- [Carbon Cycle](#)
- [Atmospheric Chemistry](#)
- [Aerosols](#)
- [Long-Term Climate Change](#)
- [Geodynamics](#)

Carbon Cycle

Esper, J. Gervin, J., Kirchman, F., Middleton, E., Knox, R., Gregg, W., Mannino, A., McClain, C., Herman, J., Hall, F. Low/Medium Density Biomass, Coastal and Ocean Carbon: A Carbon Cycle Mission. Document ID (CASI): 20030022698.

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Atmospheric Chemistry

Abdelkhalik, O. O., Nairouz, B., Weaver, T., Newman, B. Engineering Feasibility and Trade Studies for the NASA/VSGC MicroMaps Space Mission. Document ID (CASI): 20030112228.

McMillian, W. W., Strow, L. L., Revercomb, H., Knuteson, R., and Thompson, A. A Climatology of Tropospheric CO over the Central and Southeastern United States and the Southwestern Pacific Ocean Derived from Space, Air, and Ground-based Infrared Interferometer Spectra. Document ID (CASI): 20030020877

Rothman, L. High-Resolution Spectroscopic Database for the NASA Earth Observing System Program. Document ID (CASI): 20030020876.

Penner, J. and Mishchenko, M. I. The Study of Biomass Emissions for Defining Radiative Forcing of Climate. Document ID (CASI). 20030004258.

Gleason, J. F. Tropospheric Chemistry Studies using Observations from GOME and TOMS. Document ID (CASI): 20030014605.

Ahmad, S. P., Johnson, J. E., Jackman, Charles H. Atmospheric products from the Upper Atmosphere Research Satellite (UARS). Document ID (CASI): 20030032197.

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Aerosols

Rothman, L. High-Resolution Spectroscopic Database for the NASA Earth Observing System Program. Document ID (CASI): 20030020876.

Penner, J. and Zhang, S. Modeling the Absorbing Aerosol Index. Document ID (CASI): 20030005685.

Chance, K., Spurr, R. J. D., Kurosu, T. P., Jacob, D. J., and Gleason, J. F. Tropospheric Chemistry Studies using Observations from GOME and TOMS. Document ID (CASI): 20030014605.

Coy, L., Stajner, I., DaSilva, A. M., Joiner, J., Rood, R. B., Pawson, S., and Lin, S. J. High-Frequency Planetary Waves in the Polar Middle Atmosphere as Seen in a Data Assimilation System. Document ID (CASI): 20030025379.

Toon, O. B., Klein, K., Gamblin, B. Modeling Aerosol Nucleation. Document ID (CASI): 20030033941.

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Long-Term Climate Change

Chaudhury, S. R. and Rodriguez, W. J. Scientific Visualization & Modeling for Earth Systems Science Education. Document ID (CASI): 20030012606.

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Geodynamics

Salstein, D. A., Rosen, R. D., Ponte, R. M., and Frey, H. Impact of Climatic Variability on Atmospheric Mass Distribution and GRACE-Derived Gravity Fields. Document ID (CASI): 20030007793.

Liu, H., Kolenkiewicz, R., Li, J., and Chen, J. Satellite Detection of the Convection Generated Stresses in Earth. Document ID (CASI): 20030093548.

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From NASA Headquarters

Who We Are at the Earth Science Enterprise

Improving life here on planet Earth is foremost in NASA's vision, and the larger purpose of NASA's Earth Science Enterprise. Using the vantage point of space, we gain an understanding of our home planet that we could never achieve were we bound to the Earth's surface. From that vantage point the Earth appears both complex and fragile; a complex, ever changing island that is the only known harbor of life in the solar system. We want to know how the Earth system is changing, and what are the consequences of life on Earth.

Planet Earth is a dynamic system of continents, oceans, atmosphere, ice, and life. Global-scale changes require global-scale observations and models, and many regional and local changes are only truly understood when seen in their global context. Programs of the Earth Science Enterprise use NASA's research and technology to advance the interdisciplinary field of Earth System Science to help fulfill NASA's mission to understand and protect our home planet.

We continue to evolve the Earth Science Enterprise in light of new scientific understanding, advances in technology, and emerging national priorities. Our research and Earth observation programs are designed to answer questions at the frontiers of science and societal concern. We provide Earth science data and information products to millions of users each year in universities, industries, and Federal and other government agencies to help them explore our home planet and improve the essential services they perform for the Nation. Among these critical services are weather forecasting, seasonal climate prediction, aviation safety, natural resources management, agricultural assessment, and infrastructure planning.

Among the key issues facing America and the world today are climate change, educating the next generation, and homeland security. The Earth Science Enterprise has a vital role to play in climate change research in support of the national policy-making process, and is a leading participant in the President's Climate Change Research Initiative and the interagency Climate Change Science Program. We are fueling a transformation of the way Earth science is taught in the United States with our view of the Earth as a planet and our ability to describe the Earth as an interconnected system. Through our data and information products and targeted collaborations with U.S. Federal agencies, state and local governments, and international partners and industry, we are helping to create a more secure world.

Earth science is science in the national interest. NASA, through the Earth Science Enterprise, is pleased to bring the view from space and the Earth system science concept to the broad national and international network of partnerships in the conduct of Earth science. We believe they will prove an essential contribution to our society and economy in the decades ahead.

For more information, go to <http://www.earth.nasa.gov/>.

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From the Centers

Preserving the Past, Navigating the Future at Goddard

The staff of the Homer E. Newell NASA Goddard Space Flight Center Library, in Greenbelt, Maryland, hosts an annual open house to celebrate and promote the capabilities of the facility. The theme of this year’s event, held on October 15, 2003, was Preserving the Past, Navigating the Future.

Dr. Linda Rosenberg, Goddard's Chief Information Officer, started the morning session by introducing Dr. Ed Rogers, Goddard's Knowledge Management Architect of Knowledge, People and Value. "We are one of a few NASA centers to have a knowledge management architect expert on site," she said. Rogers then described how knowledge management is being understood and used at Goddard. He explained the processes and expected outcomes of being knowledge management smart. For Goddard, he said, knowledge management should increase knowledge utilization, mission safety and assurance, and Goddard should realize an increase in core competencies. In an afternoon session, Dr. Howard McCurdy, Professor of Public Affairs and Chair of the Public Administration Department at American University, in Washington, D.C., spoke on the influence of low-cost initiatives on the NASA Space Flight Program.

Demonstrations were held throughout the day and included:

- The New MyLibrary Portal
- The New Web of Knowledge
- Library One Search
- Website Capture Project
- Digital video technologies
- Interactive technical handbooks
- Semantic Search Engine for Technical Information
- James Web Space Telescope Next Generation Integrated Network
- IMAGES (Image and Movie Archive of Goddard’s Earth and Space Sciences)

The demonstrations revealed the capabilities and coordinated efforts that have been established with other organizations throughout the Center.

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JSC Houses Coordination Effort for Return to Flight Response

The Johnson Space Center (JSC) has been the hub of the Agency-wide Return to Flight Planning Team’s effort to create, publish, and disseminate NASA’s response to the Columbia Accident Investigation Board’s Report. The team, assembled from representatives across the Agency, is chaired by Col. James Halsell and housed at JSC.

An iterative publication process has been employed to capture the changing scope of the Agency’s response as the return to flight effort matures and expands. The initial publication of the plan, NASA's Implementation Plan for Space Shuttle Return to Flight and Beyond, was released to the public in September 2003 and included distribution to the NASA Administrator, Congress, and the press. Since its initial release, the document has been revised twice with a third revision scheduled for the beginning of 2004. Until the Shuttle fleet returns to flight, the Planning Team will continue its tireless work to capture and publish the maturing response.

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Current Topics

Goddard Earth Science Publications

The [Goddard Space Flight Center \(GSFC\)](#) is an excellent source of Earth science STI. Recent publications available at the Goddard Library include:

Chan, A. K. Wavelets for sensing technologies. (QA403.3 .C43 2003 BOOK/CD-ROM 2003)
Girard, M. . Processing of remote sensing data. (TA1632 .G57 2003 BOOK/CD-ROM 2003)
Goni, G. J. Interhemispheric water exchange in the Atlantic Ocean. (GC228.6 .A73 I55 2003)
Haining, R. P. Spatial data analysis: theory and practice. (QA278.2 .H345 2003)
Mix, D. F. Elements of wavelets for engineers and scientists. (QA403.3 .M59 2003)

In addition, the NASA [Goddard Institute for Space Studies \(GISS\)](#), a division of NASA's Goddard Space Flight Center Earth Sciences Directorate and a unit of the Columbia University Earth Institute, is a treasure trove of Earth sciences publications. GISS emphasizes a broad study of global change, an interdisciplinary research initiative addressing natural and man-made changes in our environment that occur on various time scales from decades to millennia and affect the habitability of our planet. The research combines analysis of comprehensive global datasets with global models of atmospheric, land surface, and oceanic processes and includes study of past events on Earth such as paleoclimate change and the study of other planets as an aid to prediction of future evolution of Earth on a planetary scale. Links to 2004 publications are presented below. You can also access their publications database directly or through the **Advanced Search** function of the [NASA Technical Reports Server \(NTRS\)](#).

<p>Bleck, R., and S. Sun 2004. Diagnostics of the oceanic thermohaline circulation in a coupled climate model. <i>Global Planet. Change</i> <b>40</b>, 233-248, doi:10.1016/j.gloplacha.2003.04.002. <a href="#">[Read Abstract]</a> <a href="#">[Download PDF]</a> <i>Note: Document is 1.1 MB.</i></p> <p>Hansen, J., and L. Nazarenko 2004. Soot climate forcing via snow and ice albedos. <i>Proc. Natl. Acad. Sci.</i> <b>101</b>, 423-428, doi:10.1073/pnas.2237157100. <a href="#">[Read Abstract]</a> <a href="#">[Download PDF]</a> <a href="#">[Read Science Brief]</a> <a href="#">[Read News Release]</a> <i>Note: Document is 800 kB. <a href="#">Supplementary material</a> is available.</i></p> <p>Jiang, Y., Y.L. Yung, S.P. Sander, and L.D. Travis 2004. Modeling of atmospheric radiative transfer with polarization and its application to the remote sensing of tropospheric ozone. <i>J. Quant. Spectrosc. Radiat. Transfer</i> <b>84</b>, 169-179, doi:10.1016/S0022-4073(03)00140-7. <a href="#">[Read Abstract]</a> <a href="#">[Download PDF]</a> <i>Note: Document is 1.4 MB.</i></p> <p>Liu, L. 2004. <i>Optical Characterization of Complex Aerosol and Cloud Particles: Remote Sensing and Climatological Implications</i>. Ph.D. thesis. Columbia University. New York, New York. <a href="#">[Read Abstract]</a></p> <p>Mishchenko, M.I., J.W. Hovenier, and D.W. Mackowski 2004. Single scattering by a small volume element. <i>J. Opt. Soc. Amer. A</i> <b>21</b>, 71-87. <a href="#">[Read Abstract]</a></p>
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Mapping a Better Vintage (and Other Earth Science Spinoffs)

If you want to know which NASA's Earth science discoveries have made their way into the mainstream, take a look at [Spinoff](#), NASA's annual publication featuring successfully commercialized NASA technology. For more than 40 years, the NASA Commercial Technology Program has facilitated the transfer of NASA technology to the private sector. Since 1976, *Spinoff* has featured between 40 and 50 of these commercial products and processes.

One technology featured in the latest issue of [Spinoff](#) is the use of image technology and Geographic Information Systems (GIS) for vineyard management support. NASA's Earth Science Enterprise partnered with the U.S. wine and commercial remote sensing industries on a project known as the Viticultural Integration of NASA Technologies for Assessment of the Grapevine Environment (VINTAGE). Based on VINTAGE's applied research, VESTRA Resources, Inc., recently released a commercial product known as the Vineyard Block Uniformity Map. Learn more in the "Mapping a Better Vintage" story. Other recent articles include:

- Pest Control on the "Fly"
  - Smooth Sailing for Weather Forecasting
  - Digital Images on the DIME
  - Supporting the Growing Needs of GIS
  - Easy and Accessible Imaging Software

To find recent or historical information quickly on another topic that interests you, try using the search function for the Spinoff Database, available at the same Website.

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NASA History

Great Earth Science Images

[GReat Images in NASA \(GRIN\)](#) is a collection of over a thousand images of significant historical interest scanned at high-resolution in several sizes. The following is a sample of great Earth science images in NASA history.

***TIROS, America's First Meteorological Satellite***  
*Goddard Space Flight Center*  
*April 1, 1960*

It is hard to imagine the evening news without satellite imagery. But in 1960, space-based meteorology was in its formative stages, still to be proven. One of the earliest groups to transfer to the newly organized Goddard Space Flight Center was a group from the Army Signal Corps, which developed the nation's first weather satellite called the Television Infrared Observation Satellite (TIROS). With the launch of TIROS-1 from Cape Canaveral on April 1, 1960, scientists immediately saw the benefit of studying Earth's weather systems from the vantage point of space. The satellite, which weighed 270 lbs. (122 kg), was specifically designed to test experimental television techniques that would lead to a worldwide meteorological information system. The spacecraft carried two television cameras, a magnetic tape recorder, timer systems, transmitters, and a power supply. Early photographs provided new information on cloud systems, including spiral formations associated with large storms, immediately proving their value to meteorologists.

***Explorer XVII Satellite***  
*Goddard Space Flight Center*  
*January 1, 1963*

Weighing 405 lbs. (184 kg), this 35-inch (89-cm) pressurized stainless steel sphere measured the density, composition, pressure, and temperature of Earth's atmosphere after its launch from Cape Canaveral on April 3, 1963. The mission was one of three that Goddard Space Flight Center specifically conducted to learn more about the atmosphere's physical properties—knowledge that they ultimately used for scientific and meteorological purposes. Explorer XVII carried two spectrometers, four vacuum pressure gauges, and two electrostatic probes. Before it reached its intended orbit that ranged from 158 to 570 miles (254-917 km) above Earth, the satellite was spun up to about 90 rpm.

***Earth Resources Technology Satellite (ERTS)***  
*Headquarters*  
*June 28, 1971*

The Earth Resources Technology Satellite (ERTS) mock-up in a space chamber test at General Electric's Space Division. The ERTS program represented a concentrated effort to observe and monitor the limited resources of the Earth, in order to best conserve and utilize the resources in support of a burgeoning world population. The first ERTS was launched in 1972 and was later named Land Remote-Sensing Satellite (LandSat), to better represent the civil satellite program's prime emphasis on remote sensing of land resources. Multiple sensors survey and relay back masses of data in various ways from the LandSat. NASA has built seven Land Remote Sensing Satellites, which have helped agricultural experts pick up underutilized land areas and new prospects for land use through irrigation. It has also assisted in pinpointing the spread of crop disease and in charting new uses of the sea for oceanographers.

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